Symons's Meteorological Magazine.

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THE BRITISH ASSOCIATION AT LEICESTER.

The annual meeting of the British Association for the Advancement of Science took place at Leicester, from the 31st of July to the 7th of August. The local arrangements were admirably carried out, the receptions and garden parties were so brilliant that the oldest frequenter could not say that he had ever seen finer. The excursions were well planned and much appreciated. The hospitality of the people of Leicester fulfilled the best traditions in the history of the Association—even the weather lent itself for once to the success of the meeting. The number of members was smaller than usual, and as a result the sum available for distribution in aid of science was less than of recent years; but the Kite Committee and the Committee for the publication of the Ben Nevis observations, each received a grant of £25.

The Meteorological Breakfast—the seventh of the second series—was held at the Grand Hotel, on the morning of Tuesday, the 6th, and there were 26 meteorologists and rainfall observers present, ladies as well as gentlemen taking part. The following is the complete list:—

J. Abercromby Alexander	Bedford	E. Kitto	... Falmouth
Dr. J. R. Ashworth	... Rochdale	Dr. H. R. Mill ...	... London
G. H. Barber ...	... London	Mrs. H. R. Mill ...	... ,,
C. O. Bartrum ...	... ,,	J. E. Petavel, F.R.S.	...Manchester
Col. Bigg-Wither	... Godalming	A. Pilling	... Capetown
Dr. Otto Boeddicker	.. Birr	E. A. Reeves ..	... London
G. G. Chisholm ...	... London	Dr. W. N. Shaw, F.R.S...	,,
Laurence Gomme	... London	Mrs. W. N. Shaw ..	,,
Mrs. Gomme	,,	M. B. Slater ...	... Malton
Allen Gomme	,,	C. Michie Smith ...	...Kodaikanal
Charles Hawksley, C.E....	,,	John Smyth, C.E.	... Banbridge
A. R. Hinks ...	... Cambridge	Miss C. O. Stevens	... Reading
T. V. Hodgson ...	... Plymouth	Prof. H. H. Turner, F.R.S.	Oxford

Reference was made at the breakfast to the fact that this gathering was the only one in connection with the Association at which those interested in observational study could meet together in virtue of their particular interests, and the opinion was expressed by more than one speaker that the time had fully come when meteorology should have separate recognition amongst the sections.

The meteorological papers which had been accepted by Section A were put down in the programme for Tuesday, but they were, as in former years, sandwiched alternately with papers on astronomy and optics, in such a way that everyone was heartily tired of waiting after hearing one paper in which he was specially interested before the next on a cognate subject was reached. The grievance is no new one; but whatever respect one feels for the dignity and distinction of the austerest section of the Association, it is no longer possible to refrain from definite criticism. In our opinion, and in this opinion we are not alone, Section A is overloaded with material too diverse to be held together under a common label. Even if the Section is sometimes sub-divided the science of meteorology, for which alone we speak, is unfairly treated. This year there was no physicist known to be sympathetic with meteorology amongst the officers of the section, and scarcely one amongst the meteorologists present at the meeting was upon the Committee. We say scarcely one, for one whose name most properly appeared was not present on the earlier days, and so was unable to do anything to improve matters. We hold the officials of the Section entirely responsible for the faulty arrangement and bad time-keeping, which made it impossible for important meteorological papers to be treated adequately, and caused even the reporters of that Gallio in matters scientific, the *Daily Mail*, to comment on the situation. There was a little grievance also, which the mathematicians and physicists of Section A shared with their more neglected colleagues,—this was the bewildering acoustic properties of the hall where the meetings were held. When the speaker faced a particular member of the audience and spoke distinctly that particular member heard perfectly; but when the speaker turned his head, ever so slightly, a confused reverberation made the words indistinguishable, and when he turned at right angles to the hearer, an exquisitely sharp echo sprang into being, so that if he spoke slowly every word was heard twice, if he spoke rapidly nothing was distinguishable but the last word of the sentence, duplicated with ringing emphasis. We amused ourselves after we had to give up the attempt to understand the papers by following with eyes shut the changes in azimuth of the speaker's head by the changes in the echo accompaniment.

Taken all round, the meteorologists had a bad time in the sections, and it is sincerely to be hoped that a new section—or at least a sub-section with a chairman, who is interested in observational studies—will be formed at an early date, otherwise it will not be worth while for any meteorologist to offer a paper to the British Association. One is strongly tempted to believe that the type of scientific mind which prevails in the quarters whence such institutions as the British Association are directed, holds that methods are all-important, and results useful only as proving the applicability of methods, while the data are merely looked upon as algebraic symbols, a or b serving as stepping stones to x and z, and not as

actual phenomena, the comprehension of which is the sole justification for applying any method at all. At the Meteorological or any other breakast, we do not consider that the end of the meal is served when we have proved that knife and fork and spoon can be applied to reduce certain solids and liquids to an assimilible form. The nature of the food is universally regarded as the most important thing, whether it be served with steel or silver. To us, as students of nature, the subject of study must always be more important than the methods which help us in the task.

The difficulties in the way of hearing and discussing the meteorological papers this year were the more disappointing because several of those which were presented were of exceptional interest, and we much regret the inadequate reports which we must offer to our readers. Although we look upon the data and the result of their discussion as much more important than the methods employed, we are fully aware that there is great scope for the treatment of meteorological statistics by new methods, and thus we hailed the discussion to be introduced by a paper on "Modern Methods in Meteorology," by Mr. Palin Elderton, with pleasurable anticipations. Unhappily, the Abstract supplied gives a minimum of information, but it is all we have to offer. Dr. Shaw's paper on new methods in forecasting from synoptic charts was cut cruelly short, on account of the failure of presidential compression in the case of a previous astronomical paper, and the reports on the extremely important kite and balloon observations were no better treated.

In other Sections there was little of meteorological importance, though some speculations of an interesting kind were made in a paper on "The Interior of the Earth," by Professor Milne, in Section C; and some rainfall data were brought forward by Mr. Smyth, of Banbridge, in Section G.

The following are the titles of the papers announced for reading in Section A, as set out in the Association's Journal :—

W. Palin Elderton.—Examples of modern Methods of treating Observations. The following members will take part in the discussion: Dr. W. N. Shaw, G. U. Yule and A. R. Hinks.

Dr. W. N. Shaw, F.R.S.—Recent Developments of the Methods of Forecasting by means of Synoptic Charts.

C. Michie Smith. — A Mountain Observatory in South India. (Lantern.)

Miss M. White, T. V. Pring and J. E. Petavel, F.R.S.—An analytical Study of the Meteorological Observations made at the Glossop Moor Kite Station during 1906-7.

Report of the Committee on Kites.

W. A. Harwood and J. E. Petavel, F.R.S.—Preliminary note on the recent International Balloon Ascents (Manchester station).

Report of the Ben Nevis Committee.

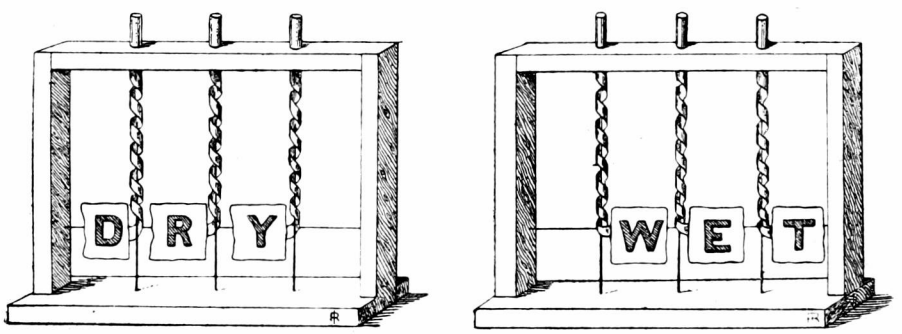
(*To be continued.*)

WEATHER WHIMS.—III.

THE FOIL HYGROSCOPE.

By Richard Inwards.

Many are the contrivances for showing changes of moisture in the air, but none is more sensitive than the silver-foil weather-flag, as depicted in the accompanying sketches. It consists of three slips of the foil used by jewellers to enhance the effect of precious stones, and sometimes to glorify pieces of plain glass so as to make them appear like gems. This foil consists of very thin silver or copper, coloured on one side with a kind of varnish, suitable for the purpose. I find that designed to imitate the sapphire does very well. It is of a fine blue colour. Three small slips are cut off by scissors (not a knife or the varnished part will peel off), these strips are then twisted round a wire until they resemble ringlets or shavings, as shown in the sketch, of course the wire is slipped out. These ringlets are supported as shown, and a needle set in the baseboard and running



up the hollow centre of each serves to keep it roughly in place, and to prevent breaking by accident. Three little paper flags are attached as shown, having on one side the letters DRY, and on the other WET. It will then be found that these flags turn round instantly when the air becomes damper or drier—indeed they will turn on the approach of a moist hand, or when they are ever so lightly breathed upon, and the strange thing is that they go back just as quickly when the damp stimulus is withdrawn. A wire stretched across the frame prevents the flags from going beyond the position where the letters are most visible. The spiral slips are fixed by seccotine at the top to small pegs which can be turned round for adjustment if required.

It is of course the varnish or colouring matter which is the hygroscopic material. I have not been able to find out what this substance is, although I have experimented with gums shellac, dextrine and other things with negative results.

My friend, Mr. Augustus Stroh, pointed out this property of the foil to me and enabled me to construct this weather-toy, which I have had some time under observation with satisfactory results.

THE KITE DISPLAY OF THE AËRONAUTICAL SOCIETY.

THE kite display organised by the Aëronautical Society of Great Britain, took place on Chobham Common, on July 1st, in the presence of a large assembly of the members and their friends, there being upwards of three thousand persons present.

At the time of the commencement of the display there were eleven large scientific kites in the air at the same moment.

Mr. W. H. Dines, F.R.S., exhibited two box kites with meteorograph of the kind in common use at the station of the Meteorological Office at Pyrton Hill. One of these was 9 ft. high, having 77 square feet of lifting surface, and weighing 11 lbs. This is the type suitable for light and moderate winds of less than 40 miles an hour, and with 10,000 feet of wire will lift a meteorograph to a vertical height of 6,000 feet. The other was 7 ft. 6 in. high, having 52 square feet of surface, and weighing 9 lbs. This type will fly in winds ranging from 25 to 50 miles an hour, and with 5,000 feet of wire will carry the recording instruments to a height ranging from 3,000 to 3,500 feet. Mr. Charles Cave also displayed a kite of the type used by Mr. Dines. Mr. Salmon's exhibit was remarkable for originality and the number of kites exhibited. One of these kites was made specially for this display, and had nine wings at each side of a backbone 18 feet high. The wings have a span from tip to tip of 10 feet. Mr. Salmon claims that this type of kite is well adapted for light winds and is easy to manipulate. Such a kite has often enabled him to raise his meteorograph 1,600 feet, when a box kite would not have left the ground. Mr. Salmon's claims were supported by actual test in this display, when with the light wind blowing the kite attained a height of some 3,000 feet. Mr. Salmon also contributed several types of box kites, and a Hargrave kite made by Mr. Hargrave. Some of the box kites had the acute angle to the front and some the obtuse. Other kites shown by the same exhibitor were a quinquengular box kite and the Barclay honeycomb kite.

Mr. Charles Brogden, who in the Aeronautical Society's Kite Competition at Finden, in 1903, attained the highest flight with his six winged bird kite, again gave a demonstration of the admirable flying qualities of this kite. On the latter occasion the height attained was estimated at about 3,000 feet (perpendicular), 3,800 feet of wire being out. The angle of the kite was fairly constant at 56 to 50 degrees from the horizontal.

Mr. Balston exhibited Zenith kites and Butterfly kites. The former are adapted for flights in strong winds, and the latter for light winds.

A Ballon-Sonde with the light meteorograph designed by Mr. Dines, recording pressure and temperature, was sent up by Mr. Charles Cave. A small rubber balloon was used having a capacity of between six and seven cubic feet when unstretched, but capable of expanding to a much larger size. The balloon was filled with

hydrogen, and had a linen parachute placed over it to which the meteorograph was attached. The ascent of the balloon was observed with theodolites placed at each end of a base of about 1,560 feet, set out at right angles to the direction of the wind. One theodolite was an ordinary transit instrument, the other has been specially designed by M. de Quervain for observing balloons. It has a reflecting prism in the axis of the telescope, so that the observer is always looking in a horizontal position even if the balloon is passing through the zenith. The balloon fell at Upminster, Essex, 41 miles east by north half north.

Mr. José Weiss performed some highly successful experiments with model gliders. There were three of these gliders exhibited, having wing areas of 3·6, 8·4 and 12·8 sq. ft., with total weights of 2½ lbs., 6 lbs., and 15 lbs. respectively; the lead ballast in each case representing about two-thirds of the total weight.

When launched from the highest hillock available the best glides obtained were some 200 yards in length, with a drop of from 30 to 50 feet. The small model, raised some 200 feet by Mr. Brogden's large kite, and released from that height, righted itself instantly in each case and gave some very fine glides, the longest being about 200 yards. E. S. B.

ROYAL METEOROLOGICAL SOCIETY.

THE last meeting for the present session was held at the Society's Rooms, 70, Victoria-street, Westminster, on Wednesday afternoon, June 19th, Dr. H. R. Mill, President, in the chair. Exigencies of space make it necessary to condense our report greatly.

Mr. F. Campbell Bayard read a paper on "Weather and Crops, 1891—1906." Mr. R. H. Hooker, Mr. R. Cooke, Mr. R. G. K. Lempfert and the President took part in the discussion.

A paper by Dr. C. P. Hooker on "The Relation of the Rainfall to the Depth of Water in a Well" was also read. The author gave the weekly measurements of the depth of water in a well 101 feet deep at Further Barton, Cirencester, compared with the weekly rainfall for the years 1903 to 1906, in continuation of an earlier paper to the Society dealing with the measurements of the same well for the years 1887—1902. The well measurements have now terminated on account of the death of the former owner.

Mr. Baldwin Latham believed that a thorough investigation of the level of water in wells would throw much light on the subject of crops. He thought that water percolated in excess in some years, robbing the earth of its nutriment, and consequently impoverishing the next crops.

Mr. Walter Child exhibited and described his "Step" Anemometer, which he has designed to obviate the "sheltering error." This instrument is a Robinson Anemometer, with the cups so

placed on the spindle that the arms are in different horizontal planes, thus one cup does not shelter another and the system comes to rest more rapidly when the wind drops.

The following gentlemen were elected Fellows of the Society :— Lieut. J. Adams, R.N.R., Sir Philip Brockelhurst, Bart., Capt. G. S. Cary, Mr. H. Chapman, Mr. J. I. Craig, M.A., Lord Ronald Sutherland Gower, Mr. G. S. Marshall, Mr. E. H. Shackleton (leader of the British Antarctic Expedition, 1907), Mr. F. R. Shackleton, Mr. D. S. Steuart, and Sir Arthur Vicars, K.C.V.O., Ulster King of Arms.

SCOTTISH METEOROLOGICAL SOCIETY.

The usual half yearly meeting of this Society was held in Edinburgh on July 9th. The Report from the Council of the Society to the General Meeting was presented, and contained the following among other paragraphs :—

Since the last meeting of the Society, the Station at Clathick, Perthshire, has been discontinued. The Council, however, are glad to say that instruments formerly at Clathick have been removed to the Strathearn Hydropathic, Crieff, where a Station has been opened under the charge of Dr. Meikle. . . . . .

It is with profound sorrow that the Council have to report the death of Dr. Alexander Buchan on 13th May last. Appointed Meteorological Secretary in 1860, when the Society was in its infancy, Dr. Buchan occupied that position for the long period of forty-seven years. This is not the place to refer to the many and great services rendered by Dr. Buchan to Meteorological Science, but the Council desire to record their sense of how much the Society owes to him. The results of many of Dr. Buchan's most important researches appeared first in the Society's *Journal*, and the welfare and honour of the Society were ever his foremost consideration. For nearly half a century the Society has been guided by a man whose faithful use of great natural gifts brought him a world-wide reputation, and whose ungrudging service has given the Society prominence in the scientific world. The Council propose to include in the next issue of the *Journal* papers dealing with various aspects of Dr. Buchan's scientific career.

The Council have appointed Mr. Andrew Watt, M.A., F.R.S.E., Meteorological Secretary to the Society. Mr. Watt had been for some time Assistant-Secretary, and largely responsible for the general work of the Society.

After the Report had been received tributes to the memory of Dr. Buchan were paid by Lord McLaren, Sir John Murray, Mr. J. G. Bartholomew, Mr. R. T. Omond and Mr. A. Watt. No meteorological papers were read, the meeting having very appropriately assumed the form of a memorial to the late Meteorological Secretary.

BEN NEVIS OBSERVATORIES.

WE quote the following from the Parliamentary Report in *The Times* of Friday, August 2nd :—

Mr. McCRAE (Edinburgh, E.), on behalf of Sir J. Dewar (Inverness), asked the Chancellor of the Exchequer if he was in a position to say whether he was able to accede to the request of the Scottish members of Parliament for a grant to the Scottish Meteorological Society for the purpose of re-opening and maintaining the Ben Nevis Observatories.

THE CHANCELLOR OF THE EXCHEQUER (Mr. Asquith).—The only scheme which has up to the present been placed before me is one under which the whole cost is of the re-equipment and maintenance of the Observatories would be thrown upon public funds, and to this I should not feel justified in assenting. I am, however, quite prepared to consider the question of renewing the Government grant, which was for many years given to these institutions through the Meteorological Council, provided that an adequate contribution towards their re-establishment and maintenance is forthcoming from other sources.

THUNDERSTORM RAINS OF JULY, 1907.

THE monthly rainfall maps in summer always present irregularities of distribution, due to heavy falls of rain during thunderstorms of short duration which affect small areas, and we are overwhelmed with correspondence on the subject, all of which we are glad to get, though we cannot find space to give all the communications in the words of the authors. The following particulars given in order of date, deserve to be put on record, and we thank our correspondents for their kindness in sending them.

July 10th.—MR. S. F. HURNARD, of Hill House, Lexden, near Colchester, reports that a severe thunderstorm passed over his station. Rain fell from 9.55 a.m. to 11.30 a.m., and yielded 1·30 in. in 1 hr. 35 min. Included in this measurement was a heavy fall of hail, which occurred between 10.40 and 11.10 a.m. Another lesser storm occurred about noon, and the total reading for the 24 hours was 1·70 in. Another rain gauge, 1½ miles to the east, yielded ·90 in., and a third still farther east only ·76 in.

July 19th.—MR. JOHN SMYTH, Milltown House, Banbridge, sends particulars of a thunderstorm with remarkably heavy hail. The storm occurred in the afternoon and evening, and at Lenaderg and other places the hail broke large quantities of glass. In one case 600 and in another 382 panes were broken.

July 21st.—MISS A. PLEYDELL BOUVERIE, The Old House, Market Lavington, Wilts, said that thunder was heard about 3.30 p.m., and rain began to fall about 3.45, lasting until 7.30 p.m., and yielding 2·55 in. in 3¾ hours. Hail accompanied the rain.

DR. SYMONS, writing from the Health Office, Guildhall, Bath, reports a rainfall of 2·90 in. at Combe Park, 2·69 in. at Henrietta

Park, and only 1·25 in. at the Statutory Hospital, 2½ miles to the south-east. The rain fell between 4 and 7 p.m.

MR. R. LEWIS LLOYD, Somerset Place, Lansdown, Bath, reports that rain began at 4.5 p.m. At 5.15 p.m. the rain moderated, and he found that 2·49 in. had fallen in 1 hour 10 min. The total fall, measured at 9 a.m. next day, was 3·27 in. He considers that Lansdown had the most severe fall in Bath on this occasion.

REV. J. TOMSON, The Rectory, Rochford, Tenbury, heard thunder about noon far away to the north-west, and at 2.45 p.m. it broke overhead, the wind suddenly rising, and by 3.15 p.m. 1·61 in. of rain was measured as the result of half-an-hour's fall. It was accompanied by hail of great size, including irregular pieces of hard clear ice. The area seriously affected was narrow, not exceeding a mile from east to west. In one hop garden the damage done by the storm was estimated at £600.

MR. LEWIS H. WILLIAMS, Edenderry, King's County, reports a fall of 1·14 in. in 20 minutes, from 5.50 to 6.10 p.m.

The storm was exceedingly severe in the north of Ireland, a fall of 1·98 in. in about an hour-and-a half being reported by MR. JOSEPH H. WELCH, of Londonderry, as occurring in the Shantallow district.

Other heavy falls on the 21st were Bourton-on-the-Water 2·06 in., Hampson in-Eliel 2·13 in., and Prestbury 1·97 in.

July 22nd.—The storms on this date were so remarkable that we devote special attention to them. One very heavy outburst occurred just to the north of London, producing in a few hours three times as much rain as fell in the south of London during the whole month.

MISS ABETHELL, Colney Hatch Lane, Muswell Hill, N., reports that the storm was very heavy from 2.50 to 6.30 p.m., by which time 1·95 in. had fallen in 3 hours 40 mins., and ·35 in. fell subsequently, making the total for the 24 hours 2·30 in.

MRS. H. R. MILL, The Hollies, Mill Hill, N.W., measured 2·15 in. at 6·40 p.m., the result of 3½ hours rain, and at 9 a.m. next morning the total reached 2·35 in. The lightning was of blinding intensity and the thunder terrific. The torrential rain washed out channels from 6 to 8 inches deep in firm gravel walks.

MISS STANTON, of Upfield, Stroud, writes, that after a thunderstorm on the 21st, yielding ·40 in. of rain, another came up from the north-west on the afternoon of the 22nd, with very heavy rain, 1·83 in. falling in 1 hour 30 min. from 3 p.m. to 4.30 p.m.; the rain continued with less intensity until 7.15 p.m., by which time 2·16 in. had fallen.

REV. R. P. DANSEY sends newspaper cuttings descriptive of the storm on the border of South Wales, and supplements them by a full and most interesting account of the work of the storm in the Black Mountains, which we hope to publish later with illustrations. Meanwhile we quote the following from the *Hereford Times*:—

The storm which approached from Talgarth way, over the Black Mountains, broke about 2 o'clock, and in a very short time the river Monnow

rose enormously, and the adjoining fields were flooded two or three feet deep. A remarkable phenomenon was the fierce shower of hailstones, which varied from the size of a walnut to a hen's egg . . . . In one portion of the Llanthony Road, for about twenty yards, the hailstones had fallen over 5 feet in depth, and the road was impassable for either vehicles or pedestrians. The Cwmyoy postman, who was returning to Abergavenny, had to leave his horse and cart behind and make his way through the ice and water as best he could . . . . On a piece of road from Henllan to Holly Pitch the road metal was carried right away, and at the bottom of the pitch there is a deposit of about 50 tons.

The district which suffered the worst of all was in the neighbourhood of Tredrenow, where the hailstones fell in such volume and force that they completely blocked the river, turning it out of its course across the road and the land adjoining. Numbers of trout and other fish were left on the road and in the fields.

Another observer writes in the same paper that he had great difficulty in getting through the great mass of hailstones on Tuesday forenoon, the day after the storm. At one place, along 40 yards of the road, the hail, which had been crushed down by the traffic, was still one foot deep, and at the sides of the road quite 5 feet. About half or three-quarters of a mile above Tredrenow, he saw an enormous chasm on the north side of the valley, down which a torrent was roaring, and he continues as follows :—

When I stopped fishing, I had a good look at the area of the storm coming back, and judged it to be nearly three-quarters of a mile wide. There was a fairly clearly defined line on each side where no hail had fallen at all, but within its area practically all vegetation had been shattered (short of trees). Bark was stripped from hedges, dock leaves reduced to skeletons, and corn simply made into pulp. I carefully examined the hailstones, and found them the size of large marbles. Eighteen hours before they must have been as large as pigeon's eggs. I was told that in the valley of the Grwyny (the next valley south) the storm was even worse.

Rev. Philip Stapleton, S.J., of St. Beuno's College, St. Asaph, says that a severe storm passed up the vale of Clwyd in the night. It began about 1.30 a.m., and the lightning was frequent and vivid, heavy rain commenced about 1.45 a.m., and lasted, with breaks, until about 4.30, in that period of 2 hrs. 45 mins., 1·22 in. fell.

Other heavy falls reported on the 22nd were 2·35 in. at Hornsey, London, N.; 2·12 in. at Etchingham Park, Finchley; 2·65 in. at Watford; 2·29 in. at New Inn, near Brecon; and 1·93 in. at Witney. The following stations reported falls exceeding an inch on the two consecutive days, 21st and 22nd.

Station.	New Inn.	Prestbury.	Torpantau.	Gt.Barrington.	Northleach.	Witney.
21st ...	1·01	1·97	1·20	1·60	1·54	1·25
22nd...	2·29	1·61	1·30	1·16	1·08	1·93
Total..	3·30	3·58	2·50	2·76	2·62	3·18

July 30th.—Rev. A. L. Brine, of Willesborough Rectory, Ashford, Kent, reports a thunderstorm of 13 minutes duration, com-

mencing at 2.1 p.m. In the first five minutes ·25 in. of rain fell, and the whole fall for the 13 minutes was ·38 in.

MR. J. BEETHAM WILSON, High Street, Dorking, writes that ·15 in. of rain fell in 10 minutes from 3.20 to 3.30 p.m., in a sharp thunderstorm.

In spite of the heavy falls quoted above the month as a whole was a dry one, the deficiency from the average being about 22 per cent. for the British Isles as a whole.

THE THUNDERSTORM OF JULY 22nd IN SOUTH-EAST CLARE.

By LIEUT.-COL. W. C. BENTLEY.

THERE were two distinct thunderstorms on the 22nd. The first came from the south-east, and went to the north-west, passing well to the north of Broadford. It began at 3.30 p.m., and ended at 5.30 p.m. There were only a few drops of rain at Broadford, Hurdlestown, but I could see there was much rain farther to the north-east.

The second storm began at 5 p.m., and lasted till 10 p.m. It came at right angles to the course of the first storm; that is to say, from the south-west passing to the north-east. There appeared to be much rain to the north; but here only ·22 in. was recorded next morning. But the drops of rain were very large. There must have been a teaspoonful of water in each of them, as the splash they made on the dry dusty roads was about an inch and a half in diameter.

There is a small district east of the Kilbane mountains, lying between that place and Killaloe, where a tremendous fall of rain took place. It is only four miles by the mountain road from Kilbane to Killaloe, one mile of which is on the west side of the pass, and three miles on the east side. On the 27th, five days after the storm, I walked this road from Kilbane to Killaloe. Hardly any rain had fallen on the west side of the pass, as the road was hardly washed clean; but on the east side the road was clean gone. Great cuts were made in it, some ten feet deep, and in one place there was a gap fully 30 feet deep. Four times I had to get into the fields in half-a-mile, as the cuts in the road were too wide and deep to get over. Between that and Killaloe there are two small rivers. I had to ford both, as the two bridges had been carried away. But one may judge how small these rivers are, when I carried my bicycle over them without getting my feet wet. One was only a wooden foot bridge, and the flood took it at once; but the other was a large stone arch, 25 feet high and 20 feet wide. Not a sign of this bridge was left; the very foundations on the solid rock were carried away. The oldest man in that neighbourhood never remembers such rain, or such a flood, as there was that evening. I was told that the hail fell not in the form of round stones, but in large rugged lumps of ice.

The whole mountain side for 3 miles was a flood everywhere. Great damage was done; farm-houses were flooded, sheep and pigs carried away, and crops destroyed. Whole fields of potatoes and turnips were washed clean away. On the bank of one of the rivers a dead ass was left in the fork of a tree, 15 feet above the ground, by the flood. In all five large stone bridges and one timber bridge were carried away. This all took place in a district 3 miles long and 1 mile wide. For a mile south of the mountains, the roads were hardly washed, yet no sand or gravel was left in either of the rivers, it was all washed away down to the hard rock. On the banks of one river there was a small wood of very large and old beech trees, nearly all of which were torn up by the roots; and a road was washed clean away for about 100 yards. It will cost the County Council about £3,000 to repair the roads and bridges; and the damage to private property must amount to as much more.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

LOCAL STORMS.

THE last number of your Magazine is almost as interesting to me for what it omits as for what it reports. I refer to the absence of any reference from Camden Square of the brisk thunderstorm which was observed here during the late afternoon of Saturday, 29th June. It seemed to come from S.S.W.; and I see by the splendid report of Mr. G. von U. Searle, on page 112, that he also experienced it in West Kensington.

The storm put into my gauge ·92 in. of rain, making the month's "takings" 3·09 in.; it gave Mr. Searle 1·22 in., so raising his total to 2·92 in.—curiously near to my own; and as the month's fall in Camden Square was without it 2·03 in, if this storm had called and treated you as liberally as it did us, we should have stood pretty nearly on the same level. Does anybody happen to know the extent of the area affected? One feels he would like to understand what is the guiding or limiting factor in the development of such phenomena.

WILLIAM GODDEN.

38, Burrard Road, West Hampstead, N.W., 19th July, 1907.

[The storm of June 29th brought ·42 in. of rain to Camden Square. All thunderstorms bring intense rains to small and often curiously outlined areas, the position of which is carefully studied and mapped for as many storms as time permits in *British Rainfall* for each year. The storm of July 22nd was much more remarkable in this respect than that of June 29th.—ED. *S.M.M.*]

"A BUSHEL OF MARCH DUST IS WORTH A KING'S RANSOM."

I HAVE always understood this saying to refer, not to the probable character of the ensuing summer, but to the value of a dry March from an agricultural point of view—as being favourable for spring sowing and cultivation. The beneficial effects of a dry spell at this season are undoubted; and no farmer was ever heard to complain of a dry March, especially if followed by seasonable "April showers."

Clifton, 25th July, 1907. ROBT. F. STURGE, F.R.Met.Soc.

COMPARISON OF SEASONS.

I WAS interested in Mr. McDowall's conclusions in the July magazine especially with regard to a dry March preceding a warm summer. My records for the Southern Counties are only complete for the 24 years 1883–1906, in which 8 dry Marches—at least half-an-inch below the average—were succeeded by 7 warm summers and 1 cold, *i.e.*, 87½ per cent. This seems remarkable, although the period is obviously too short to establish a rule for these results.

The following also refer to the same period of 24 years :—

Mild or cold winters, followed by summers of the same character—

	16	times out of 22,	or 73	per cent.
Warm or cold springs	14	,, ,,	20, or 70	,,
Wet or dry winters	5	,, ,,	18, or 28	,,
,, ,, springs	11	,, ,,	16, or 69	,,

Haslemere, Surrey, August 5th. ARTHUR F. PARBURY.

PHOTOGRAPHIC SUNSHINE RECORDERS.

WITH reference to your remarks in the October number of the *Meteorological Magazine* for 1906 (p. 168) regarding the Jordan Sunshine Recorder, I made a series of comparative observations with this instrument and the Campbell-Stokes Recorder during the months of March and April of the present year. The results of these experiments I venture to submit to you herewith, and, thinking you may be interested to compare the *actual* records, I likewise send them for your perusal.

I find that the Jordan recorder registered 15 hours more sunshine than the Campbell-Stokes in the period of 61 days. During those months there was an exceptional amount of bright sunshine, especially in March. I think that the difference in the two registers may be accounted for by the prevalence of much haziness in the atmosphere and by early hoar frosts, which would retard the burning action of the rays more than they would affect the photographic action.

I should state that the two instruments were supplied by Messrs. Negretti and Zambra; they were placed side by side on the same

stand, and exposed to the full action of the sun, at an elevation of 200 ft. above the sea-level.

The photographic charts used were prepared at different dates as indicated, but I note no difference in their relative sensitiveness. In order to determine this point satisfactorily, it would be necessary to use two photographic recorders working side by side under similar conditions, with their charts prepared at different times.

Incidentally I note, with reference to the character of the traces produced by the Campbell-Stokes recorder, that during periods of sunspots they are in a marked degree more intensely burnt than at times when there are no sunspots. I am not aware if this effect is usually noticed by observers or whether it is merely accidental.

Comparative Records of the Campbell-Stokes and Jordan Sunshine Recorders, during the Months of March and April, 1907.

Numerous large Sunspots. (*See the Campbell-Stokes charts.*)

Date.	Campbell-Stokes.	Jordan.*	Difference.	Weather Remarks.
	hours.	hours.	hours.	
Mar. 1	8·0	9·2	+1·2	Hoar frost in early morning.
,, 2	·6	·6	—	Sea fog off and on, cloudy.
,, 3	7·3	7·4	+ ·1	,, ,, fine.
,, 4	8·6	9·1	+ ·5	Early frost and light sea fog.
,, 5	8·5	8·8	+ ·3	,,
,, 6	9·1	9·2	+ ·1	Fine.
,, 7	2·7	3·3	+ ·6	Hoar frost, cloudy.
,, 8	4·5	4·0	— ·5	Cloudy.
,, 9	2·7	2·7	—	,,
,, 10	1·6	1·5	— ·1	Showery.
,, 11	7·9	7·6	— ·3	Cloudy.
,, 12	6·7	6·5	— ·2	Early frost.
,, 13	6·5	6·7	+ ·2	Fine, cloudy later.
,, 14	8·0	8·3	+ ·3	,, slightly hazy.
,, 15	·3	·3	—	Overcast and showery.
,, 16	—	—	—	Overcast all day.
,, 17	7·9	8·3	+ ·4	Fine, cloudy.
,, 18	3·9	4·8	+ ·9	Early haze and rain.
,, 19	9·1	9·3	+ ·2	Fine. Sunspots disappear.
,, 20	7·5	7·8	+ ·3	Fine.
,, 21	10·0	10·7	+ ·7	Early frost, fine.
,, 22	6·9	7·0	+ ·1	,, afternoon cloudy.
,, 23	9·4	9·8	+ ·4	Hazy in early morning.
,, 24	9·7	10·6	+ ·9	,, ,,
,, 25	8·2	9·7	+1·5	Early hoar frost and fog.
,, 26	9·4	9·6	+ ·2	,, ,, ,,
,, 27	10·7	11·2	+ ·5	Early haze, clear sunset.
,, 28	10·5	11·2	+ ·7	Hazy horizon all day.
,, 29	10·0	10·4	+ ·4	,, and sea fog all day.
,, 30	10·7	11·1	+ ·4	Hazy horizon all day.
,, 31	10·1	10·5	+ ·4	,, and sea fog.
	217·0	227·2	+10·2	

* The photographic charts used from March 1st to March 28th were prepared December 6th, 1906.

Comparative Records of the Campbell-Stokes and Jordan Sunshine Recorders during the Months of March and April, 1907—(continued).

	Date.	Campbell-Stokes.	Jordan.†	Difference.	Weather Remarks.
		hours.	hours.	hours.	
Numerous Sunspots.	April 1	9·5	9·8	+ ·3	Hazy horizon, fine.
	,, 2	9·3	9·3	—	Sea fog, fine.
	,, 3	4·4	4·5	+ ·1	Cloudy, fog and rain afternoon.
	,, 4	4·7	7·0	+2·3	Thin filmy clouds all day.
	,, 5	6·7	6·4	— ·3	Cloudy, slight haze.
	,, 6	6·4	5·7	— ·7	,, rain.
	,, 7	2·7	2·7	—	,, showery and some snow.
	,, 8	2·5	2·5	—	Showery.
	,, 9	3·8	4·6	+ ·8	Cloudy.
	,, 10	3·2	3·0	— ·2	,,
	,, 11	4·3	4·3	—	Early fog, cloudy.
	,, 12	—	—	—	Overcast, rain.
	,, 13	9·0	9·0	—	Hazy in early morning.
	,, 14	—	—	—	Overcast, rain.
	,, 15	10·0	10·5	+ ·5	Slight haze.
	,, 16	3·3	3·3	—	Sea fog, overcast.
	,, 17	8·1	8·1	—	Hazy horizon all day.
	,, 18	7·2	6·8	— ·4	Early hoar frost, cloudy.
	,, 19	4·8	4·9	+ ·1	,,
	,, 20	11·0	11·6	+ ·6	,,
	,, 21	—	—	—	Overcast, rain.
	,, 22	7·0	7·7	+ ·7	Hazy horizon, fine.
	,, 23	6·2	8·4	+2·2	,, all day.
	,, 24	11·3	11·0	— ·3	Very fine and hot.
	,, 25	1·7	1·7	—	Cloudy, overcast and rain.
	,, 26	—	—	—	Overcast and rain.
	,, 27	8·3	8·0	— ·3	Hazy horizon, cloudy later.
	,, 28	10·9	10·5	— ·4	Fine.
	,, 29	3·1	3·0	— ·1	Cloudy.
	,, 30	·4	·4	—	Overcast, showery.
	Total, April ...	159·8	164·7	+ 4·9	
	,, March..	217·0	227·2	+10·2	
	,, Mar.&Apl.	376·8	391·9	+15·1	
	Possible Sunshine, March & April,	782 hours.			
		48%	50%	+2%	

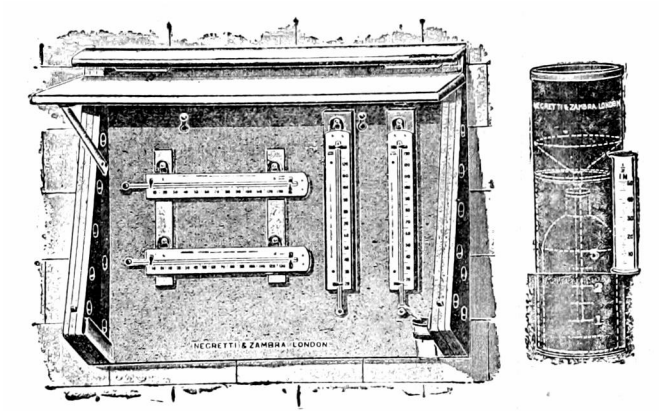
† The photographic charts used from March 29th to April 30th were prepared March 26th, 1907.

JAMES B. JORDAN.

"*Hayfield*," *Hythe, Kent, June 10th, 1907.*

A SIMPLE CLIMATOLOGICAL OUTFIT.

MESSRS. NEGRETTI AND ZAMBRA have introduced a simple set of meteorological instruments for climatological observations, intended to meet the demand for an accurate but low-priced equipment for use in schools, and for other similar purposes.



If the cost of a Stevenson screen is prohibitive, and if it is not the immediate intention of the observer to send his records to one of the Meteorological Societies or the Meteorological Office, we do not think that a better form of exposure for the thermometers could be devised than that hit upon by the makers in the "Public School Set." It is preferable, in our opinion, to the Glaisher stand which is still sometimes used, and it may be that it will prove as serviceable as the standard Stevenson screen itself.

The equipment consists of a maximum thermometer, minimum thermometer, wet bulb and dry bulb thermometers. These are hung on a board which is intended to be suspended on a north wall. The back is provided with projecting triangular sides, made of two boards held apart and pierced with holes in such a way as to admit air and exclude rain. A lid, hinged at the top, rests on these side boards when the screen is in use, and the protection is all that could be desired. When opened for reading, as shown in the illustration, the lid is supported by a moveable arm. In addition to the thermometers, the set includes a Snowdon rain gauge and graduated measure, an observation book, and a copy of "Hints to Meteorological Observers."

The instruments will all pass the Kew tests, and certificates can be supplied. We are fortunate in this country in having more than one firm of instrument makers whose name is a guarantee of the excellence of their workmanship, and no name stands higher with regard to meteorological instruments than that of the long-established firm of Negretti and Zambra.

EVAPORATION IN DESERT CONDITIONS.

We quote the following from a recent number of *Science* :—

"An exceptional opportunity for the study of evaporation in relation to climate is afforded by the Salton Sea. As our readers are aware, the sea was created by the accidental turning of the Colorado River into the Salton Basin, a dry valley in south-eastern California lying below the level of the ocean ; and now that the river has been restored to its original channel, the sea has begun to dry away. The time required for its complete dissipation is estimated at from ten to fifteen years, and during that period the accession of water from all sources will be nominal. It will thus constitute an evaporation pan on a grand scale, and the measurement of its progressive lowering will give valuable information to engineers charged with the planning of reservoirs. The matter is also of importance to meteorologists, and arrangements have been made for a joint investigation by the U.S. Weather Bureau, the U.S. Reclamation Service and the U.S. Geological Survey. To determine the relation of the evaporation to temperature, atmospheric humidity and wind, a group of meteorological stations are to be maintained in the Salton Basin ; and the endeavour will be made to develop a general formula for the estimation of evaporation in any locality where the ordinary climatic factors are known. A reconnaissance of the region has just been made by a board composed of F. H. Bigelow, C.E. Grunsky and G. K. Gilbert, representing severally the bureaus mentioned above."

THE CONDITIONS OF THE UPPER AIR IN INDIA.*

BETWEEN August 26th and September 12th, 1905, at a spot situated about nine kilometres west-north-west of Karachi and within one kilometre from the Arabian Sea, several kite flights were made preliminary to a more detailed investigation of the upper air in India by means of kites. The kites were fitted with meteorographs and some of the results of the actual flights are here epitomized :—

(1). The highest flight occurred on August 28th, when an altitude of 1,380 metres was reached.

(2). A nearly saturated stratum of air from the sea extended from the ground 10 metres above sea level, upwards to an altitude of 500 metres on August 27th, 800 metres on August 28th, 1,130 metres on August 31st, and 600 metres on September 12th.

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* An abstract from an account of the preparations made for determining the conditions of the upper air in India by means of kites.

Memoirs of the Indian Meteorological Department ; Vol. XX., Part 1 ; Calcutta. Published under the direction of Gilbert T. Wheeler, M.A., Sc.D., F.R.S., Meteorological Reporter to the Government of India.

[We regret that this notice has been standing in type for a very long time, but on the principle of "better late than never," we think it would be worse to cancel it than to print it.—ED. *M.M.*]

(3). Above the nearly saturated stratum a very dry wind of relative humidity about 10 per cent. was encountered; as the zero of the humidity scale of the meteorograph changed rapidly as the kite entered this dry current some uncertainty, however, attached to the actual readings in the current, the uncertainty being estimated as representing an error of as much as 10 per cent.

(4). This dry upper current, which was of land origin, exhibited at the levels reached by the kites very rapid diurnal variations of temperature, which are considered too great to be due to variations in the direct absorption of solar radiation.

(5). The changes occurring in the dry upper land current were concluded to have been much larger and more rapid than those in the lower moist sea current.

(6). It seems probable that the moist lower current was of the dimensions of a sea breeze, whereas the dry upper current formed part of a large air movement.

In this report coloured plates are produced indicating for the hours of 8 and 10 a.m. in August and September the normal wind directions and pressure distribution over the Indian Empire. From these it is seen that towards midday in August a well marked cyclonic circulation developes over the heated desert tracts of north-west India; but the most remarkable fact which the plates show is the relatively great change in the pressure distribution that occurs between 8 and 10 a.m., indicating how prominent diurnal changes are in tropical countries.

In our part of the world changes in the distribution of atmospheric pressure due to the time of day are so insignificant that they are completely obscured by those due to the time of year, but more especially by those which in our ignorance as to their causes we may describe as accidental.—L. C. W. B.

METEOROLOGICAL NEWS AND NOTES.

THE ROYAL METEOROLOGICAL SOCIETY organised an interesting Meteorological Exhibit in connection with the Agricultural Education and Forestry Section of the Royal Agricultural Society's recent Show at Lincoln. The exhibit was attractively arranged, and was intended to illustrate the Society's work in diffusing a knowledge of meteorology. Various patterns of self-recording and other instruments were shown, together with specimens of lightning conductors and objects damaged by lightning. Diagrams relating to rainfall, temperature, sunshine, the influence of weather on crops, health and such matters, and a collection of photographs illustrating meteorological phenomena were also exhibited. A fully equipped Climatological Station, with the various instruments in position, was arranged in a railed-off enclosure in the grounds, and lectures were given by Mr. W. Marriott on "Meteorology in Relation to Agriculture."

THE DEATH OF MR. J. M. PHILLPOTT, F.R.Met.Soc., on July 17th, removed the chief assistant in the office of *British Rainfall* and of this Magazine. Mr. Phillpott, after several years in the office of the Royal Meteorological Society, joined the staff of the British Rainfall Organization in November, 1899, a few months before the death of Mr. Symons, and he rapidly mastered the complicated details of the work, in which year by year he took an increasing share. Mr. Phillpott was a singularly accurate worker, and his keen interest in all that concerned meteorological work, combined with his pleasant unassuming manner, made him a valued friend of everyone with whom he worked. Much of his work was in connection with this Magazine. Mr. Phillpott, who was 34 years of age, leaves a widow and two young children.

TWO METEOROLOGICAL OFFICE APPOINTMENTS have been intimated. Mr. R. H. Curtis has been appointed Superintendent of the Instruments Branch, with which the Observatories Branch will be incorporated. Mr. Richard Corless, B.A., Sidney Sussex College, Cambridge, has been appointed Special Assistant to the Director.

THE INTERNATIONAL INVESTIGATIONS IN THE UPPER ATMOSPHERE, which are carried out monthly at the same time at the kite and balloon observatories in different parts of Europe, were conducted on an extended scale in the last week of July. On that occasion not only were observations made at the regular stations, but also at sea in various parts of the northern hemisphere, and at supplementary stations on shore. The Royal Meteorological Society and the Kite Committee of the British Association secured observations with free balloons at several stations, particulars of which we hope to give in an early number.

NEWSPAPER WRITERS, and even some scientific men, in calling attention to the causes of the very wet summer of 1907, have given reasons which in some cases seemed very convincing, only it so happens that the summer, or the year so far as it has gone, has not been very wet at all! Up to the end of July the rainfall for the British Isles as a whole was normal.

Errata.—In the supplementary table of rainfall last month the rainfall for June at Plynlimon was given as 1·53 in., the figure ought to have been 15·25 in., and as this is an exceptionally heavy fall, even at so wet a station, we should be glad if our readers would make the correction in their copies. Mr. Denning asks us to correct the date of the cold day mentioned on p. 111 in the July number, from "July 14th, 1876," which is an error, to "July 14th, 1875," which is corrected.

TEMPERATURE FOR JULY, 1907.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea. ft.	TEMPERATURE. Max. °	Max. Date.	Min. °	Min. Date.	No. of Night at or below 32° Shade.	Grass.
Camden Square	*London*	51 32	0 8	111	80·7	15	42·3	11	0	0
Tenterden	*Kent*	51 4	*0 41	190	74·5	15	42·0	11	0	0
West Dean	*Hampshire*	51 3	1 38	137	77·0	15,20	38·0	11	0	3
Hartley Wintney	,,	51 18	0 53	222	82·0	20,21	42·0	13	0	...
Hitchin	*Hertfordshire*	51 57	0 17	238	75·0	20	39·0	11	0	...
Winslow (Addington)	*Buckinghamshr.*	51 58	0 53	309	78·0	19	38·0	11	0	0
Bury St. Edmunds (Westley)	*Suffolk*	52 15	*0 40	226	75·5	27,29	40·0	11	0	...
Brundall	*Norfolk*	52 37	*1 26	66	73·2	29	40·2	23	0	0
Winterbourne Steepleton	*Dorset*	50 42	2 31	316	76·8	17	39·0	8,13	0	0
Torquay (Cary Green)	*Devon*	50 28	3 32	12	77·3	17	44·9	11	0	...
Polapit Tamar [Launceston]	,,	50 40	4 22	315	57·9	26	36·1	11	0	0
Bath	*Somerset*	51 23	2 21	67	80·0	20	41·0	12	0	...
Stroud (Upfield)	*Gloucestershire*	51 44	2 13	226	80·0	20	45·0	11	0	...
Church Stretton (Woolstaston)	*Shropshire*	52 35	2 48	800	77·5	19	34·0	1,2,3	0	...
Coventry Kingswood	*Warwickshire*	52 24	1 30	340	75·0	20	43·0	3	0	...
Boston	*Lincolnshire*	52 58	0 1	25	75·0	16	40·0	11	0	...
Worksop (Hodsock Priory)	*Nottinghamshire*	53 22	1 5	56	75·7	16,18	37·3	1	0	3
Derby (Midland Railway)	*Derbyshire*	52 55	1 28	156	80·0	17,18	38·0	11	0	0
Bolton (Queen's Park)	*Lancashire*	53 35	2 28	390	77·1	17	39·6	1	0	0
Wetherby (Ribston Hall)	*Yorkshire, W.R.*	53 59	1 24	130	...	...	...	...	...	...
Arncliffe Vicarage	,, ,,	54 8	2 6	732	...	...	...	...	...	...
Hull (Pearson Park)	,, *E.R.*	53 45	0 20	6	76·0	28	40·0	11	0	...
Newcastle (Town Moor)	*Northumberland*	54 59	1 38	201	...	...	...	...	...	...
Borrowdale (Seathwaite)	*Cumberland*	54 30	3 10	423	81·7	18	41·5	2	0	...
Cardiff (Ely)	*Glamorgan*	51 29	3 13	53	...	...	...	...	...	...
Haverfordwest (High Street)	*Pembroke*	51 48	4 58	95	80·2	18,20	42·5	12	0	...
Aberystwyth (Gogerddan)	*Cardigan*	52 26	4 1	83	85·0	20	33·0	10	0	...
Llandudno	*Carnarvon*	53 20	3 50	72	76·0	17	46·2	4	0	...
Cargen [Dumfries]	*Kirkcudbright*	55 2	3 37	80	81·4	16	40·0	2,11	0	...
Lilliesleaf (Riddell House)	*Roxburgh*	55 31	2 46	550	...	..	...	...	...	...
Edinburgh (Royal Observy.)	*Midlothian*	55 55	3 11	442	77·1	16	42·8	7	0	0
Girvan (Pinmore)	*Ayr*	55 10	4 49	207	84·0	17	41·0	1,11	0	0
Glasgow (Queen's Park)	*Renfrew*	55 53	4 18	144	78·0	17	41·0	6	0	3
Tighnabruaich	*Argyll*	55 55	5 14	50	74·0	17	38·0	6	0	...
Mull (Quinish)	,,	56 36	6 13	35	81·0	20	...	...	...	...
Dundee (Eastern Necropolis)	*Forfar*	56 28	2 57	199	83·0	16	40·0	7	0	...
Braemar	*Aberdeen*	57 0	3 24	1114	...	...	...	...	...	...
Aberdeen (Cranford)	,,	57 8	2 7	120	74·0	15,16	40·0	6	0	...
Cawdor (Budgate)	*Nairn*	57 31	3 57	250	...	...	...	...	...	...
Invergarry	*E. Inverness*	57 4	4 47	13c?	...	...	...	...	...	...
Loch Torridon (Bendamph)	*W. Ross*	57 32	5 32	20	...	...	...	...	...	...
Dunrobin Castle	*Sutherland*	57 59	3 56	14	69·0	16	42·0	9	0	...
Castletown	*Caithness*	58 35	3 23	100	74·0	15	36·0	18	0	0
Killarney (District Asylum)	*Kerry*	52 4	9 31	178	85·0	19	39·0	11	0	...
Waterford (Brook Lodge)	*Waterford*	52 15	7 7	104	80·0	17,18	39·0	5	0	...
Broadford (Hurdlestown)	*Clare*	52 48	8 38	167	81·0	22	40·0	10	0	...
Abbey Leix (Blandsfort)	*Queen's County*	52 56	7 17	532	80·0	19	...	...	...	...
Dublin (Fitz William Square)	*Dublin*	53 21	6 14	54	77·3	17	43·8	11	0	0
Ballinasloe	*Galway*	53 20	8 15	160	85·2	17	36·0	2	0	...
Clifden (Kylemore House)	,,	53 32	9 52	105	...	...	...	...	...	...
Crossmolina (Enniscoe)	*Mayo*	54 4	9 18	74	...	...	...	...	...	...
Seaforde	*Down*	54 19	5 50	180	88·0	17	40·0	10	0	...
Londonderry (Creggan Res.)	*Londonderry*	54 59	7 19	320	...	...	...	...	...	...
Omagh (Edenfel)	*Tyrone*	54 36	7 18	280	...	..	...	...	...	...

RAINFALL FOR JULY, 1907.

RAINFALL OF MONTH.							RAINFALL FROM JAN. 1.					
Aver. 1870-99.	1907.	Diff. from Av.	% of Av.	Max. in 24 hours.		No. of Days	Aver. 1870-99.	1907.	Diff. from Aver.	% of Av.	Mean Annual 1870-1899.	STATION.
in.	in.	in.		in.	Date.		in.	in.	in.		in.	
2·49	1·96	— ·53	79	·61	22	15	13·12	12·00	— 1·12	91	25·16	Camden Square
2·26	1·20	—1·06	53	·32	30	14	13·81	11·36	— 2·45	82	28·36	Tenterden
2·62	1·45	—1·17	55	·47	21	13	15·23	12·20	— 3·03	80	29·93	West Dean
2·38	1·47	— ·91	62	·46	21	14	13·97	12·95	— 1·02	93	27·10	Hartley Wintney
2·55	1·82	— ·73	71	·36	10	17	12·81	12·82	+ ·01	100	24·66	Hitchin
2·77	1·94	— ·83	70	·52	4	15	14·05	13·06	— ·99	93	26·75	Addington
2·91	1·76	—1·15	60	·56	10	13	13·23	13·97	+ ·74	106	25·39	Westley
2·70	1·30	—1·40	48	·51	30	12	12·82	14·87	+ 2·05	116	25·40	Brundall
2·78	1·27	—1·51	46	·29	3	12	19·14	16·18	— 2·96	85	39·00	Winterbourne Stpltn
2·73	1·98	— ·75	73	·88	2	16	17·78	15·18	— 2·60	85	35·00	Torquay
2·93	1·56	—1·37	53	·35	2	16	18·38	17·27	— 1·11	94	38·85	Polapit Tamar
2·83	4·80	+1·97	170	2·69	21	14	15·86	16·92	+ 1·06	107	30·75	Bath
2·90	4·33	+1·43	149	2·18	22	16	15·73	15·68	— ·05	100	29·85	Stroud
2·66	3·08	+ ·42	116	·54	22	19	16·97	17·94	+ ·97	106	33·04	Woolstaston
2·75	2·96	+ ·21	108	·83	21	17	15·31	15·10	— ·21	99	29·21	Coventry
2·44	1·61	— ·83	66	·25	22	13	12·20	11·20	— 1·00	92	23·30	Boston
2·51	1·43	—1·08	57	·38	10	16	13·32	11·80	— 1·52	89	24·70	Hodsock Priory
2·63	2·67	+ ·04	102	·71	21	18	14·11	15·78	+ 1·67	112	26·18	Derby
4·12	3·77	— ·35	91	·90	21	21	20·87	26·51	+ 5·64	127	42·43	Bolton
2·61	1·77	— ·84	68	·49	30	18	14·24	14·83	+ ·59	104	26·96	Ribston Hall
4·97	3·15	—1·82	63	·37	8,26	20	31·44	36·21	+ 4·77	115	60·96	Arncliffe Vic.
2·50	1·41	—1·09	56	·23	5, 8	14	13·74	13·71	— ·03	100	27·02	Hull
2·91	1·74	—1·17	60	·25	3, 29	17	14·26	13·68	— ·58	96	27·99	Newcastle
9·37	4·28	—5·09	46	1·18	7	15	66·73	67·46	+ ·73	101	132·68	Seathwaite
3·52	2·66	— ·86	76	·60	4	17	20·71	19·46	— 1·25	94	42·81	Cardiff
3·70	2·17	—1·53	59	·45	24	16	23·37	21·09	— 2·28	90	47·88	Haverfordwest
4·27	4·44	+ ·17	104	·75	4	15	21·86	25·49	+ 3·63	117	45·41	Gogerddan
2·61	2·28	— ·33	87	·63	24	16	14·79	12·84	— 1·95	87	30·98	Llandudno
3·30	1·71	—1·59	52	·38	12	13	22·05	26·00	+ 3·95	118	43·43	Cargen
3·26	...	...	...	...	...	..	17·14	...	...	...	33·04	Riddell House
...	2·49	..	...	·77	4	14	...	12·64	...	...	...	Edinburgh
3·60	3·21	— ·39	89	1·08	12	19	24·12	...	...	...	48·87	Girvan
3·36	2·80	— ·56	83	·73	12	15	18·30	21·78	+ 3·48	119	35·80	Glasgow
4·33	5·01	+ ·68	116	1·67	12	14	28·98	33·78	+ 4·80	117	57·90	Tighnabruaich
4·38	2·83	—1·55	65	·95	12	17	28·22	27·76	— ·46	98	57·53	Quinish
3·03	2·30	— ·73	76	·75	7	18	15·12	16·30	+ 1·18	108	28·95	Dundee
2·89	1·65	—1·24	57	...	...	...	17·83	17·45	— ·38	98	36·07	Braemar
3·02	1·88	—1·14	62	·43	7	16	16·71	16·84	+ ·13	101	33·01	Aberdeen
3·34	2·65	— ·69	79	·44	9	12	15·26	18·12	+ 2·86	119	29·37	Cawdor
3·78	2·48	—1·30	66	·60	12	11	28·50	34·10	+ 5·60	120	56·00	Invergarry
6·46	5·11	—1·35	79	·75	10	18	42·50	55·37	+12·87	130	86·50	Bendamph
2·82	1·57	—1·25	56	·33	9	12	16·27	20·11	+ 3·84	124	31·60	Dunrobin Castle
...	1·19	...	...	·20	4	19	...	18·05	...	...	...	Castletown
3·99	2·32	—1·67	58	·37	3	19	29·98	21·30	— 8·68	71	58·11	Killarney
3·10	3·04	— ·06	98	1·26	24	16	20·29	18·62	— 1·67	92	39·30	Waterford
2·94	2·51	— ·43	85	·53	13	18	17·06	18·61	+ 1·55	109	33·47	Hurdlestown
3·05	4·19	+1·14	137	·85	22	20	18·25	19·86	+ 1·61	109	35·19	Abbey Leix
2·63	2·02	— ·61	77	·46	3	19	14·51	14·35	— ·16	99	27·75	Dublin
3·31	2·89	— ·42	87	·52	22	22	19·23	20·65	+ 1·42	107	37·04	Ballinasloe
6·15	4·16	—1·99	68	1·02	3	13	40·44	35·19	— 5·25	87	80·23	Kylemore House
3·59	2·43	—1·16	68	·48	10	20	25·33	28·56	+ 3·23	113	50·50	Enniscoe
3·40	2·23	—1·17	66	·40	2, 12	13	20·32	22·85	+ 2·53	112	38·61	Seaforde
3·47	3·84	+ ·37	111	·90	12	19	20·54	29·74	+ 9·20	145	41·20	Londonderry
3·39	...	...	...	...	...	...	19·25	...	...	...	37·85	Omagh

SUPPLEMENTARY RAINFALL, JULY, 1907.

Div.	STATION.	Rain inches	Div.	STATION.	Rain. inches
II.	Abinger Hall	1·65	XI.	Rhayader, Tyrmynydd	4·72
,,	Ramsgate	1·69	,,	Lake Vyrnwy	3·55
,,	Hailsham	1·42	,,	Llangyhanfal, Plâs Draw	2·10
,,	Crowborough, Uckfield Lodge	2·24	,,	Criccieth, Talarvor	1·84
,,	Totland Bay, Aston House.	...	,,	Llanberis, Pen-y-pass	5·53
,,	Emsworth, Redlands	1·45	,,	Lligwy	2·00
,,	Alton, Ashdell	1·55	,,	Douglas, Woodville	1·81
,,	Newbury, Welford Park	2·35	XII.	Stoneykirk, Ardwell House	2·42
III.	Harrow Weald, Hill House.	2·37	,,	Dalry, The Old Garroch	2·77
,,	Oxford, Magdalen College	3·06	,,	Langholm, Drove Road	2·76
,,	Bloxham Grove	2·07	,,	Moniaive, Maxwelton House	1·85
,,	Pitsford, Sedgebrook	2·46	XIII.	N. Esk Reservoir [Penicuick]	3·35
,,	Huntingdon, Brampton	1·93	XIV.	Maybole, Knockdon Farm	2·25
,,	Wisbech, Bank House	2·10	XV.	Campbeltown, Witchburn	3·00
IV.	Southend Water Works	1·02	,,	Inveraray, Newtown	3·56
,,	Colchester, Lexden	2·59	,,	Ballachulish House	3·70
,,	Newport, The Vicarage	2·36	,,	Islay, Eallabus	3·72
,,	Rendlesham	2·36	XVI.	Dollar Academy	3·19
,,	Swaffham	1·74	,,	Loch Leven Sluice	2·50
,,	Blakeney	1·50	,,	Balquhidder, Stronvar	2·34
V.	Bishops Cannings	2·30	,,	Perth, Pitcullen House	2·34
,,	Ashburton, Druid House	2·73	,,	Coupar Angus Station	2·36
,,	Okehampton, Oaklands	3·37	,,	Blair Atholl	1·66
,,	Hartland Abbey	1·60	,,	Montrose, Sunnyside Asylum	2·02
,,	Lynmouth, Rock House	1·32	XVII.	Alford, Lynturk Manse	2·30
,,	Probus, Lamellyn	1·94	,,	Keith Station	3·39
,,	Wellington, The Avenue	1·73	XVIII.	N. Uist, Lochmaddy	1·39
,,	North Cadbury Rectory	1·88	,,	Alvey Manse	1·72
VI.	Clifton, Pembroke Road	2·72	,,	Loch Ness, Drumnadrochit.	2·24
,,	Ross, The Graig	2·14	,,	Glencarron Lodge	4·19
,,	Shifnal, Hatton Grange	2·51	,,	Fearn, Lower Pitkerrie	2·56
,,	Cheadle, The Heath House.	2·80	XIX.	Invershin	1·33
,,	Blockley, Upton Wold	3·10	,,	Altnaharra	1·64
,,	Worcester, Boughton Park.	2·54	,,	Bettyhill	1·29
VII.	Market Overton	2·72	XX.	Dunmanway, The Rectory	2·17
,,	Market Rasen	1·88	,,	Cork	2·20
,,	Bawtry, Hesley Hall	2·21	,,	Darrynane Abbey	2·36
VIII.	Neston, Hinderton Lodge	2·04	,,	Glenam [Clonmel]	2·58
,,	Southport, Hesketh Park	1·78	,,	Ballingarry, Gurteen	3·27
,,	Chatburn, Middlewood	2·43	,,	Miltown Malbay	3·38
,,	Cartmel, Flookburgh	2·89	XXI.	Gorey, Courtown House	3·23
IX.	Langsett Moor, Up. Midhope	2·34	,,	Moynalty, Westland	2·28
,,	Scarborough, Scalby	1·03	,,	Athlone, Twyford	1·83
,,	Ingleby Greenhow	1·69	,,	Mullingar, Belvedere	2·16
,,	Mickleton	2·21	XXII.	Woodlawn	3·71
X.	Bardon Mill, Beltingham	2·28	,,	Westport, Murrisk Abbey	...
,,	Ewesley, Fallowlees	1·90	,,	Collooney, Markree Obsy	2·88
,,	Ilderton, Lilburn Cottage	2·39	,,	Mohill	2·89
,,	Keswick, York Bank	1·83	XXIII.	Enniskillen, Portora	...
XI.	Llanfrechfa Grange	3·30	,,	Warrenpoint, Summer Hill.	1·40
,,	Treherbert, Tyn-y-waun	5·54	,,	Banbridge, Milltown	3·12
,,	Carmarthen, The Friary	2·94	,,	Belfast, Springfield	2·92
,,	Castle Malgwyn [Llechryd].	1·78	,,	Bushmills, Dundarave	3·24
,,	Plynlimon	7·20	,,	Stewartstown, The Square	2·64
,,	Crickhowell, Ffordlas	3·60	,,	Killybegs	4·06
,,	New Radnor, Ednol	3·71	,,	Horn Head	2·76

METEOROLOGICAL NOTES ON JULY, 1907.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Temp. for Temperature; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail; S for Snow.

LONDON, CAMDEN SQUARE.—Cool and cloudy throughout; the max. shade temp. touched 80° on one day only, and failed to reach 70° on 17 occasions. Mean temp. 60°·1, or 3°·2 below the average. Duration of sunshine 162·6* hours, and of R 23·8 hours. Sharp TS on 10th, and heavy T on 22nd.

CROWBOROUGH.—Unseasonable weather with unusually low temp., and only an occasional warm day. Mean temp. 57°·1, or 4°·4 below the average. R ·49 in. below the average of 36 years. Several TSS, severe on 22nd and 30th.

HARTLEY WINTNEY.—Cloud and low temp. prevailed throughout, and there was no summer weather. The rough wind of June continued till 10th.

TORQUAY.—Duration of sunshine 236·6* hours, or 11·0 hours above the average. Mean temp. 58°·9, or 2°·9 below the average.

CLIFTON.—Very wet and cold till 8th, but fine and hot from 11th to 20th. Heavy TS on 21st, and afterwards dull and cool. R ·22 in. below the average.

STROUD.—Severe TSS on 21st and 22nd. On the latter day 1·16 in. fell between 3 and 4.30 p.m., and another 1·00 in. from 4.30 to 5.30 p.m. A heifer was killed by L, and a belfry in Stroud and a tree close by were struck.

WORCESTER.—About ten days of fine weather from 10th, with temp. well above 80° from 15th to 21st, but otherwise cool and stormy, with cold nights. Severe TS on 21st, and two houses struck by L.

BOLTON.—Generally very unsettled with low temp. The only summer-like weather was between 11th and 19th, when most of the sunshine was recorded. Mean temp. 55°·2, or 1°·3 below the average. Duration of sunshine 109·8* hours, or 42·9 hours below the average. Severe TS on 21st.

SOUTHPORT.—Dry and normally sunny, yet, but for a warm period during the third week, unusually cold. Mean temp. 57°·7, or 2°·0 below the average. Duration of sunshine 213 hours, or 1 hour above the average. R 1·21 in. below the average, but subsoil water and brooks were at an exceptionally high level. Duration of R 36·0 hours. TSS on 4th, 21st and 22nd, the last occasioning serious damage.

ABERYSTWYTH.—Heavy R from 1st to 9th, with little sun; splendid weather from 9th to 22nd, after which it completely broke up.

DOUGLAS.—Dry and quiet, and a great improvement on the previous months, although unseasonably cold in the first fortnight and last week. Beautiful summer weather with high temp. from 14th to 23rd.

DUMFRIES.—The wet weather of June continued till 13th, when dry warm weather succeeded, effecting a marvellous change in farm and garden.

MULL, QUINISH.—The cold sunless weather ended abruptly with heavy R on 12th, and the following 11 days of sunshine and heat entirely altered the agricultural situation, so that the year promised to be a good one.

COUPAR ANGUS.—R ·59 in. above the average; and mean temp. 56°·6, or 0°·7 below the average. With the exception of five days from 13th, it was like May and June, both cold and wet.

DRUMNADROCHIT.—R ·58 in., and rain days 2, below the average of 21 years.

MILTOWN MALBAY.—Until St. Swithin's day it was unnaturally cold and rainy, but this ended with heavy R on 12th and 13th, and torrid heat continued almost to the end.

DUBLIN.—Cold and broken at first, but warm from 12th to 21st, and thundery from 20th to 22nd; afterwards unsettled, showery and gusty. Mean temp. 59°·6, or 0°.9 below the average.

BANBRIDGE.—On 19th H stones fell six inches in circumference, and weighing more than an ounce each.

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* Campbell-Stokes.

Climatological Table for the British Empire, February, 1907.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	Absolute. Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Max. on Grass.	Total Rain. Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	52·0	17	23·4	24	43·0	32·7	34·4	87	80·1	20·9	1·17	13	...
Malta	...	...	...	...	...	...	...	...	...	...	...	...	...
Lagos	96·0	15	71·0	13	88·1	75·9	75·0	77	151·0	67·5	·20	4	6·7
Cape Town	89·8	4	54·7	20	78·4	60·5	59·0	71	...	...	·23	5	3·3
Durban, Natal ...	90·0	19	64·1	14	84·1	69·6	...	...	147·2	...	4·06	16	1·1
Johannesburg	79·9	9	51·8	14	73·1	56·4	57·2	82	158·4	49·5	6·25	15	5·4
Mauritius	88·3	2*	67·0	?	85·8	72·2	69·4	74	151·2	61·4	2·75	15	6·4
Calcutta...	88·0	27	51·4	10	82·6	61·5	59·6	67	146·9	45·0	·09	1	2·8
Bombay...	88·7	28	63·3	1	83·7	69·9	65·0	69	132·1	54·9	·27	1	0·4
Madras	91·4	24	63·6	13	86·2	68·4	68·6	77	142·0	63·4	·00	0	2·0
Kodaikanal	72·0	13	44·9	10	67·6	47·6	42·2	59	130·3	30·3	·00	0	2·6
Colombo, Ceylon ...	92·4	9	70·2	14,15	87·6	72·8	70·5	73	151·8	64·0	3·85	7	3·3
Hongkong	67·8	28	46·7	21	61·8	55·2	51·2	75	125·5	...	·17	2	8·0
Melbourne	103·8	25	45·2	10	75·3	53·8	50·7	64	154·6	38·1	·66	3	3·8
Adelaide	105·2	24	50·0	18	88·8	63·1	50·4	40	154·7	43·4	·19	3	2·5
Coolgardie	106·5	2	52·0	17	90·7	63·5	55·3	48	176·9	49·5	·98	3	2·6
Sydney	88·9	14	59·9	19	76·9	63·8	60·6	71	127·5	50·2	2·57	16	6·1
Wellington	77·2	16	49·4	27	69·3	57·9	54·6	73	128·0	40·0	3·94	9	6·0
Auckland	78·0	8	56·0	25	72·9	61·1	55·7	65	144·0	52·0	5·79	10	5·3
Jamaica, Negril Point.	85·9	24	61·0	2	83·0	66·6	65·1	72	...	...	·68	4	...
Trinidad	91·0	14	63·0	1	85·3	66·8	68·3	77	160·0	61·0	·44	5	...
Grenada	87·0	9	69·0	5	82·7	71·1	67·9	72	152·0	...	2·54	18	3·0
Toronto	41·0	13	- 6·1	12	26·1	10·2	12·7	81	49·0	-11·5	·15	3	6·2
Fredericton	39·0	14	-25·5	24	20·0	-2·9	...	77	...	...	·00	0	5·2
St. John's, N.B. ...	43·3	15	-11·3	23	25·2	6·2	...	...	...	...	1·07	2	5·6
Victoria, B.C.	53·1	19	25·5	3	46·4	37·0	...	...	...	...	3·89	14	7·7
Dawson	45·0	15	-55·0	22	-18·2	-34·1	...	...	...	...	·00	0	5·5

* and 16, 26.

Johannesburg.—Bright sunshine 199·9 hours.

Mauritius.—Mean temp. of air 0°·3, dew point 1°·5, relative humidity 3·5 per cent., and R 3·90 in. below, averages. Mean hourly velocity of wind 8·5 miles, or 2·5 below average.

MADRAS.—Mean temp. of the air slightly above the average.

KODAIKANAL.—Bright sunshine 249 hours.

COLOMBO.—Mean temp. of air 80°·2 or same as average, of dew point 70°·5 or same as average, and R 1·74 in. above average. Mean hourly velocity of wind 6·3 miles.

HONGKONG.—Mean temp. of air 58°·7. Bright sunshine 96·5 hours. R 1·70 in. below average. Mean hourly velocity of wind 15·3 miles.

Adelaide.—Mean temp. of air 2°·0 above, and R ·41 in. below, averages.

Sydney.—Mean temp. of air 0°·7 below, and R 2·11 in. below, averages.

Wellington.—Mean temp. of air 1°·2 above, and R ·60 in. above averages.

Auckland.—Mean temp. of air close to average. Rainfall largely in excess of average.